We claim:

1. A method for producing a sintered carbon block by direct heat transfer, the method comprising:

a) selecting a mixture comprising least one polymer and at least one carbon compound;

b) providing a gas;

c) heating said gas to a vicat temperature, said vicat temperature being determined by the composition of the polymer and carbon mixture;

d) introducing said heated gas into a mold defined by interior and exterior walls, wherein at least one interior wall and at least one exterior wall is permeable to the heated gas;

e) passing said heated gas heated gas through said mixture between said interior and exterior walls; and

d) sintering said mixture for a predetermined time period by direct heat transfer,

whereby a sintered carbon block is formed.

2. The method of Claim1, wherein the method further comprises the step of compressing the gas prior to heating the gas.

3. The method of Claim1, wherein the gas is chemically non-reactive with said polymer and carbon mixture.

4. The method of Claim 1, wherein the gas is selected from the group comprising carbon dioxide (CO_2), nitrogen (N_2), helium, or ambient atmospheric air.

5. The method of Claim 1, wherein the heated gas passes through at least one permeable interior wall of said mold, through said polymer and carbon mixture, and out through at least one permeable exterior wall.

6. The method of Claim 1, wherein said gas is recovered and recycled upon passing through said mixture.

7. The method of Claim 1, further comprising the step of cooling said sintered carbon block, wherein a gas is cooled, introduced into the mold by way of at least one permeable interior wall, passes through said sintered carbon block and is exhausted by way of at least one permeable exterior wall.

8. The method of Claim1, wherein the mold is formed of a porous and sintered metal.

9. The method of Claim 1 wherein the amount of time the mixture is sintered is governed by the equation:

$$t = M_b C_b \Delta T_b / q_a C_a \Delta T_a, \text{ wherein}$$

M_b is the mass of the block powder mixture;

C_b is the effective specific heat of the block powder mixture;

q_a is the mass rate of flow of the heating gas; and

C_a is the specific heat of the heated gas.

10. The method of Claim 1 wherein the gas is heated to a temperature from approximately 275° F to approximately 400° F.